WASHINGTON STATE DEPARTMENT OF ECOLOGY

Fecal Coliform Facts

Fecal Coliform Bacteria in Washington Waterbodies

Water Quality Public Forums

Public Open Houses will be held this month on Water Cleanup Plans for fecal coliform in two northwest streams:

Wednesday May 8

North Creek Draft Water Cleanup Plan

6:30 to 8:30pm at the NW Stream Center Conf. Room, 600 128th St. SE, Everett, WA 98208.

Monday May 13

Union River Draft Water Cleanup Plan

3:00 to 5:00pm, and 6:30 to 8:30pm at Theler Community Center Conf. Rm 1, E 22871 Hwy. 3, Belfair, WA.

Contact Information

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This Fact Sheet provides information about the problem of fecal coliform bacteria in Washington streams and lakes. The state Department of Ecology (Ecology) is charged with maintaining a list of 'impaired' waterbodies (the 303-d list), and is responsible for developing Water Cleanup Plans for these waterbodies. Excess fecal coliform in water is the most common cause of listing on the state impaired waterbodies list. Fecal coliform are used as indicators for pathogens, or disease-causing bacteria in water. Because of the small size of pathogens, they are easily carried by stormwater runoff or other discharges into natural waterbodies. Once in a stream, lake, or estuary, they can infect humans through contaminated fish and shellfish, skin contact, or ingestion of water.

Fecal Coliform Facts

- **Raw human sewage** typically is 2-3 times orders of magnitude "stronger" than stormwater runoff in terms of coliform production, and 4-5 orders of magnitude "stronger" than forest runoff influenced only by wildlife sources (Pitt, 1998).

- **Cats and dogs** are primary sources of fecal coliform in urban watersheds in the Puget Sound region, and residential lawns, driveways and streets are major source areas for bacteria (Trial et al., 1993).

- **Livestock** are major sources of fecal coliform in unsewered urban watersheds, particularly those areas of the urban fringe that have horse pastures, "hobby" farms and ranchettes (Samadpour and Checkowitz, 1998).

- **Bacteria** often settle out of water into bottom sediments, where they can persist and even multiply for weeks or months in the warm, dark, moist and organic-rich conditions found there. When the sediments are stirred up, the bacteria become resuspended in the water column (Burton et al., 1987).

Urban Stormwater Loads

Estimating bacteria pollutant loading from urban stormwater is complicated by a lack of data and high variability in available monitoring data. Both viruses and pathogenic bacteria have been detected in storm runoff from urban areas at densities high enough to suggest potential health risk (EPA, 2001).

Water Cleanup Plans

Water Cleanup Plans are also known as TMDLs. A Total Maximum Daily Load (or TMDL) is a written, quantitative assessment of a water quality problem and an analysis of the pollutant sources that cause the problem. A TMDL is a tool for implementing state water quality standards and is based on the relationship between sources of pollutants and in-stream water quality conditions. The TMDL establishes the allowable loadings for specific pollutants that a waterbody can receive and still meet water quality standards (EPA, 2001).

Potential Sources of Coliform Bacteria in an Urban Watershed

Human Sources

Sewered watershed

- Combined sewer overflows
- Sanitary sewer overflows
- Illegal sanitary connections to storm drains
- Illegal disposal to storm drains

Non-Sewered watershed

- Failing septic systems
- Poorly operated package plant
- Landfills

Non-Human Sources

Domestic animals and urban wildlife

- Dogs, cats
- Rats, raccoons
- Pigeon, gulls, ducks, geese

Livestock and rural wildlife

- Cattle, horses, poultry
- Beaver, muskrats, deer, waterfowl
- Hobby farms

References

Burton, A., D. Gunnison and G. Lanza, 1987. Survival of pathogenic bacteria in various freshwater sediments. *Applied and Environmental Microbiology*, 53(4) 633-638.

Pitt, R., 1998. Epidemiology and stormwater management. In *Stormwater Quality Management*, CRC/Lewis Publishers, New York, NY.

Samadpour, M. and N. Checkowitz, 1998. Little Soos Creek microbial source tracking. *Washington Water RESOURCE*, Spring, 1998. University of Washington Urban Water Resources Center.

Trial, W., et al., 1993. Bacterial source tracking: studies in an urban Seattle watershed. *Puget Sound Notes*. 30:1-3.

EPA, 2001. Protocol for Developing Pathogen TMDLs, US Environmental Protection Agency, EPA 841-R-00-002, January 2001.